4th Quarterly Report – Public Page

Date of Report: October 18, 2011

Contract Number: **BAA No. DTPH56-10-T-000019**

Prepared for: *DOT/PHMSA*

Project Title: Advanced Development of PipeGuard™ – Proactive Pipeline Damage Prevention System (Project #364)

Prepared by: NSEARCH/Northeast Gas Association

Contact Information: Angelo Fabiano (afabiano@northeastgas.org, 973.265.1900 ext 215)

For quarterly period ending: September 30, 2011

Public Page Section- Pipe Guard™ is a system originally developed as a general purpose sensor using seismic processing techniques to determine the presence of digging events (tunneling, drilling, etc.) near and around buried pipeline facilities. The technology inherent in PipeGuard™ is highly relevant for LDC and other natural gas operators as a tool to detect excavations in the vicinity of critical pipeline sections. The objective of the project is to transform PipeGuard™ from a general purpose seismic sensor into a practical operating tool for utility operators. Properly engineered, this platform will provide early warning of excavation events via wireless communications. The system must be simple to install and allow for permanent and semi-permanent monitoring options.

Results and Status-- The original PipeGuard™ System test site with two sensing units was remotely monitored by the contractor, Magal-Senstar Inc. (MSI), via a web interface. The system installed in Stony Brook, NY using a wireless link setup is also being monitored by National Grid's Distribution Dispatch Center (approximately 30 miles away from the site). The existing PipeGuard application without improvements is able to detect and provide alarms on backhoe digging events up to 100 feet away from the sensing source. The target detection distance for the project, once improvements are made, is 250 feet.

It has been determined that the best course of action to meet target specifications was to develop a new printed circuit board (PCB) and electronics for the Advanced PipeGuard System. This development is a major undertaking and has been the major focus for MSI engineers located at their development facility in Israel. There also has been progress in other scheduled work in addition to the PCB effort. This includes evaluating and/or improving: geophone design and configuration, improving signal to noise ratio, analyzing

equipment signatures, identifying location of excavating events, developing new hardware enclosure, reducing power requirements and reducing the cost of systems to improve the economics for short pipeline sections.

Plans for Future Activity- The Advanced PipeGuard™ system will be developed to meet target detection goals and field tested at distribution pipelines test sites in late 2011 and 2012. The program schedule provides for installing Advanced PipeGuard Systems at two separate sites with different environments and soil conditions. A series of tests will be performed with a variety of excavating equipment and results will be recorded. Based on these tests system modifications to hardware and software will be made to optimize the final system design.